APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,390	10/20/2003	Mark Beaumont	DB001063-000	4149

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EXAMINER
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ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/689,390	BEAUMONT, MARK
	Examiner	Art Unit	
	Jacob Petranek	2183	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>31 July 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-36</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-36</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>31 July 2006</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-36 are pending.

2.   The office acknowledges the following papers:

Specification, claims, drawings, and arguments filed on 7/31/2006.

Withdrawn objections and rejections

3.   The drawing objections have been withdrawn due to amendment.

4.   The specification objections have been withdrawn.

5.   The 35 USC § 101 claim rejection for claim 36 has been withdrawn due to

amendment.

6.   The 35 USC § 112 second paragraph claim rejections for claims 2-6, 9-13, 16-

20, 23-27, and 30-34 have been withdrawn due to amendment.

Drawings

7.   The drawings are objected to under 37 CFR 1.83(a). Figure 3 now contains a

counter as amended, but doesn't have a reference number to the specification. A

number should be added that could be used to reference the specification for further

information about the counter. No new matter should be entered. Each drawing sheet

submitted after the filing date of an application must be labeled in the top margin as

either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

New Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9.   Claims 1-6, 8-13, 15-20, 22-27, 29-34, and 36 are rejected under 35 U.S.C.

§103(a) as being unpatentable over Crozier (U.S. 5,081,700), in view of Pechanek et al.

(U.S. 6,338,129).

10.   As per claim 1:

Crozier disclosed a method of rotating data in a plurality of processing elements,

comprising:

A plurality of shifting operations (Crozier: Figures 5a-d, column 5 lines 39-

58)(Figure 5 shows a plurality of shift operations between figures 5b-d.); and

A plurality of storing operations, said shifting and storing operations coordinated

to enable a three shears operation to be performed on the data (Crozier: Figures 5a-d,

column 5 lines 39-58)(A three shears operation involves three separate shifts on data.

The method of rotating data in figure 5 involves 3 separate shifts. Figure 5b involves a

down shift, figure 5c involves a left shift, and figure 5d involves an up shift. The shifting

results in a 90-degree rotation of the data.).

Crozier failed to teach wherein said plurality of storing operations is responsive to

each processing element's position in said array and operations are performed by a

plurality of processing elements connected in an array.

However, Pechanek disclosed wherein said plurality of storing operations is

responsive each processing element's position in said array (Pechanek: Figure 1a, column 1 lines 46-67 continued to column 2 lines 1-28)(Pechanek disclosed a plurality of processing elements that the image rotation method of Crozier could be done on. The data is inherently stored in the processing element upon each shifting.).

Operations are performed by a plurality of processing elements connected in an array (Pechanek: Figure 1a, column 1 lines 46-67 continued to column 2 lines 1-28)(The shifting and storing operations done by Crozier in combination with Pechanek result in operations being done in processing elements.).

Image processing is an example of an application that can be done efficiently on a parallel processor (Pechanek: Column 1 lines 13-20). One of ordinary skill in the art would have been motivated to find such image processing applications that work on the parallel processing unit Pechanek uses to find Crozier's method of image rotation. Thus, it would have been obvious to one of ordinary skill in the art to implement Crozier's method of image rotation on the parallel processor of Pechanek for the advantage of being able to efficiently process the images.

11.   As per claim 2:

Crozier and Pechanek disclosed the method of claim 1 wherein said plurality of storing operations are responsive to initial counts (Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4 lines 12-22)(Crozier disclosed maintaining counters for the shifting being done to perform the 90-degree rotation. It's inherent that there is an initial count determined to know how many shift operations will be done.).

Crozier and Pechanek failed to teach where one of said initial counts which are

either loaded into at least one of said processing elements or calculated locally based

on the processing element's location.

However, one of ordinary skill in the art would recognize that the shifting counters

placement doesn't have an effect on the process of shifting the data and could be

placed anywhere. Thus, it would have been obvious to one of ordinary skill in the art to

implement shift counters within the processing elements to determine how many shift

operations are left. In addition, according to "In re Japikse" (181 F.2d 1019, 86 USPQ

70 (CCPA 1950)), shifting the location of parts doesn't give patentability over prior art.

12.   As per claim 3:

Crozier and Pechanek disclosed the method of claim 2 additionally comprising

maintaining a current count in each processing element for each initial count, said

current counts being responsive to said initial counts and the number of data shifts

performed (Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4

lines 12-22)(It would have been obvious to one of ordinary skill in the art at the time of

the invention that the counters could have been initially set and decremented until the

data arrived in the correct place to perform the 90-degree rotation as shown in figures

5b-d.).

13.   As per claim 4:

Crozier and Pechanek disclosed the method of claim 3 wherein said maintaining

current counts includes altering said initial counts at programmable intervals by a

programmable amount (Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and

column 4 lines 12-22)(It would have been obvious to one of ordinary skill in the art at the

time of the invention that the counters could have been initially set and decremented

until the data arrived in the correct place to perform the 90-degree rotation as shown in

figures 5b-d.).

14.   As per claim 5:

Crozier and Pechanek disclosed the method of claim 4 wherein said initial counts

are decremented in response to a shifting of data to produce said current counts

(Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4 lines 12-

22)(It would have been obvious to one of ordinary skill in the art at the time of the

invention that the counters could have been initially set and decremented until the data

arrived in the correct place to perform the 90-degree rotation as shown in figures 5b-d.).

15.   As per claim 6:

Crozier and Pechanek disclosed the method of claim 5 wherein a storing

operation is performed when a current count in a processing element is non-positive

(Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4 lines 12-

22)(It would have been obvious to one of ordinary skill in the art at the time of the

invention that the counters could have been initially set and decremented until the data

arrived in the correct place to perform the 90-degree rotation as shown in figures 5b-d.

Additionally, it would have been obvious to one of ordinary skill in the art that upon

reaching zero, the data values would be stored so that the next shifting could occur with

the data in the correct places.).

16.   As per claim 8:

Crozier disclosed a method of rotating data in a plurality of processing elements,

comprising:

A first shifting of a first plurality of data in a first direction (Crozier: Figure 5b,

column 5 lines 39-58);

A second shifting of a second plurality of data in a second direction perpendicular

to said first direction (Crozier: Figure 5c, column 5 lines 39-58);

A third shifting of a third plurality of data in a third direction opposite to said first

direction (Crozier: Figure 5d, column 5 lines 39-58).

Crozier failed to teach storing data in a plurality of processing elements.

However, Pechanek disclosed storing data in a plurality of processing elements

(Pechanek: Figure 1a, column 1 lines 46-67 continued to column 2 lines 1-

28)(Pechanek disclosed a plurality of processing elements that the image rotation

method of Crozier could be done on. The data is inherently stored in the processing

element upon each shifting.).

Image processing is an example of an application that can be done efficiently on

a parallel processor (Pechanek: Column 1 lines 13-20). One of ordinary skill in the art

would have been motivated to find such image processing applications that work on the

parallel processing unit Pechanek uses to find Crozier's method of image rotation.

Thus, it would have been obvious to one of ordinary skill in the art to implement

Crozier's method of image rotation on the parallel processor of Pechanek for the

advantage of being able to efficiently process the images.

17.   As per claim 9:

Crozier and Pechanek disclosed the method of claim 8 wherein said first, second

and third storing of data are responsive to initial counts (Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4 lines 12-22)(Crozier disclosed maintaining counters for the shifting being done to perform the 90-degree rotation. It's inherent that there is an initial count determined to know how many shift operations will be done.).

Crozier and Pechanek failed to teach where one of said initial counts, which are either loaded into at least one, said processing elements or calculated locally based on the processing element's location.

However, one of ordinary skill in the art would recognize that the shifting counters placement doesn't have an effect on the process of shifting the data and could be placed anywhere. Thus, it would have been obvious to one of ordinary skill in the art to implement shift counters within the processing elements to determine how many shift operations are left. In addition, according to "In re Japikse" (181 F.2d 1019, 86 USPQ 70 (CCPA 1950)), shifting the location of parts doesn't give patentability over prior art.

18.   As per claim 10:

Claim 10 essentially recites the same limitations of claim 3. Therefore, claim 10 is rejected for the same reasons as claim 3.

19.   As per claim 11:

Claim 11 essentially recites the same limitations of claim 4. Therefore, claim 11 is rejected for the same reasons as claim 4.

20.   As per claim 12:

Claim 12 essentially recites the same limitations of claim 5. Therefore, claim 12 is rejected for the same reasons as claim 5.

21.   As per claim 13:

Claim 13 essentially recites the same limitations of claim 6. Therefore, claim 13

is rejected for the same reasons as claim 6.

22.   As per claim 15:

Claim 15 essentially recites the same limitations of claim 8. Claim 15 additionally

recites the following limitations:

Plurality of processing elements arranged in an array (Pechanek: Figure 1a,

column 1 lines 46-67 continued to column 2 lines 1-28)(The processing elements of

figure 1a are arranged in an array.).

23.   As per claim 16:

Claim 16 essentially recites the same limitations of claim 2. Therefore, claim 16

is rejected for the same reasons as claim 2.

24.   As per claim 17:

Claim 17 essentially recites the same limitations of claim 3. Therefore, claim 17

is rejected for the same reasons as claim 3.

25.   As per claim 18:

Claim 18 essentially recites the same limitations of claim 4. Therefore, claim 18

is rejected for the same reasons as claim 4.

26.   As per claim 19:

Claim 19 essentially recites the same limitations of claim 5. Therefore, claim 19

is rejected for the same reasons as claim 5.

27.   As per claim 20:

Claim 20 essentially recites the same limitations of claim 6. Therefore, claim 20 is rejected for the same reasons as claim 6.

28.   As per claim 22:

Claim 22 essentially recites the same limitations of claim 8. Claim 22 additionally recites the following limitations:

.   Crozier and Pechanek failed to teach first shifting on a plurality of data in done in a first pair of directions, second shifting on a plurality of data in done in a second pair of directions, and third shifting on a plurality of data in done in a third pair of directions.

However, it would have been obvious to one of ordinary skill in the art to perform a pair of shifts for each cycle of shifting. Looking at figure 5 in Crozier, the data to be shifted 90-degrees is an 8x8 matrix. Looking at figure 5b, the shifting that occurs is downward from figure 5a. The left-most column is shifted down 7 spaces, with the columns to the right being shifted down 6, 5, 4, 3, 2, 1, and 0 spaces respectively. One of ordinary skill in the art would recognize that the left-most column in figure 5a containing the letter 'a' could instead be shifted up 1 space to achieve the same arrangement as shown in figure 5b. One of ordinary skill in the art would also realize the same up shifting process could be applied to shift the columns going down 6 and 5 spaces and instead shift up 2 and 3 spaces respectively. One of ordinary skill in the art would realize that this process of shifting two different directions would result in a total of 12 shifting cycles being saved. Thus, it would have been obvious to one of ordinary skill in the art to implement shifting in a pair of directions to increase the performance of the rotation process.

29.   As per claim 23:

Claim 23 essentially recites the same limitations of claim 9. Therefore, claim 23

is rejected for the same reasons as claim 9.

30.   As per claim 24:

Claim 24 essentially recites the same limitations of claim 3. Therefore, claim 24

is rejected for the same reasons as claim 3.

31.   As per claim 25:

Claim 25 essentially recites the same limitations of claim 4. Therefore, claim 25

is rejected for the same reasons as claim 4.

32.   As per claim 26:

Claim 26 essentially recites the same limitations of claim 5. Therefore, claim 26

is rejected for the same reasons as claim 5.

33.   As per claim 27:

Claim 27 essentially recites the same limitations of claim 6. Therefore, claim 27

is rejected for the same reasons as claim 6.

34.   As per claim 29:

Claim 29 essentially recites the same limitations of claim 22. Claim 29

additionally recites the following limitations:

Plurality of processing elements arranged in an array (Pechanek: Figure 1a,

column 1 lines 46-67 continued to column 2 lines 1-28)(The processing elements of

figure 1a are arranged in an array.).

35.   As per claim 30:

Claim 30 essentially recites the same limitations of claim 2. Therefore, claim 30

is rejected for the same reasons as claim 2.

36.   As per claim 31:

Claim 31 essentially recites the same limitations of claim 3. Therefore, claim 31

is rejected for the same reasons as claim 3.

37.   As per claim 32:

Claim 32 essentially recites the same limitations of claim 4. Therefore, claim 32

is rejected for the same reasons as claim 4.

38.   As per claim 33:

Claim 33 essentially recites the same limitations of claim 5. Therefore, claim 33

is rejected for the same reasons as claim 5.

39.   As per claim 34:

Claim 34 essentially recites the same limitations of claim 6. Therefore, claim 34

is rejected for the same reasons as claim 6.

40.   As per claim 36:

Claim 36 essentially recites the same limitations of claim 1. Therefore, claim 36

is rejected for the same reasons as claim 1.

41.   Claims 7, 14, 21, 28, and 35 are rejected under 35 U.S.C. §103(a) as being

unpatentable over Crozier (U.S. 5,081,700), in view of Pechanek et al. (U.S. 6,338,129),

further in view of Taylor (U.S. 4,992,933).

42.   As per claim 7:

Crozier and Pechanek disclosed the method of claim 1.

Crozier and Pechanek failed to teach selecting which processing elements are active in response to a row select signal and a column select signal.

However, Taylor disclosed selecting which processing elements are active in response to a row select signal and a column select signal (Taylor: Figure 1, column 4 lines 7-29).

The row and column select signals allow the array processor to locally modify global shift instructions (Taylor: Column 2 lines 42-54). The advantage of increased flexibility in shifting operations would have motivated one of ordinary skill in the art to implement row and column select signals. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement row and column select signals for the advantage of increased flexibility in global shift operations.

43.   As per claim 14:

Claim 14 essentially recites the same limitations of claim 7. Therefore, claim 14 is rejected for the same reasons as claim 7.

44.   As per claim 21:

Claim 21 essentially recites the same limitations of claim 7. Therefore, claim 21 is rejected for the same reasons as claim 7.

45.   As per claim 28:

Claim 28 essentially recites the same limitations of claim 7. Therefore, claim 28 is rejected for the same reasons as claim 7.

46.   As per claim 35:

Claim 35 essentially recites the same limitations of claim 7. Therefore, claim 35

is rejected for the same reasons as claim 7.

Response to Arguments

47.   The arguments presented by Applicant in the response, received on 7/31/2006

are partially considered persuasive.

48.   Applicant argues that "Crozier fails to disclose rotating data in a plurality of

processing elements."

This argument is found to be persuasive for the following reason. However,

Crozier was not relied on for rejecting that particular limitation. In response to

applicant's arguments against the references individually, one cannot show

nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA

1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

49.   Applicant argues that "Pechanek fails to disclose rotating data in a plurality of

processing elements."

This argument is not found to be persuasive for the following reason. The

processor of Crozier disclosed a three-shears operation of rotating data in figure 5 that

results in a 90 degree rotating of the data. Pechanek disclosed an array of processing

elements that are very efficient at operating on image processing in parallel. Pechanek

disclosed the ability to move data through the array of elements efficiently by enabling

all of the array elements to transfer data to it's northern, western, eastern, and southern

neighbors. One of ordinary skill in the art would realize that the array processor of

Pechanek is capable of storing parts of a full image, such an 8x8 array of values from

Crozier, in each of the processing elements in order to efficiently perform an operation

on the image. One of ordinary skill in the art would realize that image rotation is just

one type of image processing application that the array processor of Pechanek would

be able to do. Thus, it's obvious to one of ordinary skill in the art at the time of the

invention that the processor of Pechanek could perform the three shears operation of

Crozier on the array processor by shifting the data through the various processing

elements until their final position is obtained.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37
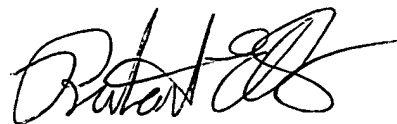
CFR 1.136(a).

The following is text cited from 37 CFR 1.111(c): In amending in reply to a

rejection of claims in an application or patent under reexamination, the applicant or

patent owner must clearly point out the patentable novelty which he or she thinks the

claims present in view of the state of the art disclosed by the references cited or the

objections made. The applicant or patent owner must also show how the amendments

avoid such references or objections.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jacob Petranek whose telephone number is 571-272-

5988. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Jacob Petranek
Examiner
Art Unit 2183

RICHARD L. ELLIS
PRIMARY EXAMINER